

moved from a first display area that is separated by a fold, to an area of the display that is smaller and on only one side of the fold, and the scale of the images is reduced to fit into the reduced display area. According to one example embodiment, a computer program implementing method 170 (FIG. 4) operates on a central processing unit and is stored in a memory device or storage device on-board or off-board display control unit 14. Display control unit 14 may include, in one embodiment, the computing system 700 of FIG. 7, wherein the computer program may be stored and executed, for example, as described with respect to program 725.

[0026] In alternative embodiments, compensation for impairment or distortion in the fold deformations may include, for example, avoiding the display of visual information in the deformed area, changes in format including stretching, narrowing, enlarging, shrinking, tilting, rotating, obliterating, replicating, interpolating or changing the color of an image or part of an image. Such compensation may be performed, for example, by substituting alternative display data or modifying the display data, by transforming the display data, and/or by adapting or modifying the generation of display control signals independently of the display data. Alternatively, compensation for impairment or distortion may include, for example, substituting or modifying fonts for text, such as fonts specifically adapted to reduce distortion experienced from proximity to a deformation 17. In general, compensation or correction for impairment or distortion may reduce or eliminate one or more undesirable effects associated with the impairment or distortion. Any technique for compensation or correction may be applied. For example, the method 170 may, in one example embodiment, mathematically determine the kinds and degrees of distortion that may be experienced by a viewer, for example assuming the display device 12 is viewed from a particular, typical, viewing angle.

[0027] A change of display format from a single display area format 190 to a dual display area format 192 is illustrated in FIG. 5A and FIG. 5B. In this example embodiment, visual information displayed in the single display area format 190 of FIG. 5A is automatically reformatted to the dual area 192 of FIG. 5B upon detection of a fold along axis 194. As illustrated in FIGS. 5A and 5B, the display area formats 190 and 192, delineated by the dashed lines, do not overlap or coincide with the fold axis 194 or any deformation resulting therefrom. In another embodiment, the reformatting may take place in response to a viewer-initiated input that is conveyed to display control unit 14. According to still another example embodiment, multiple predetermined display formatting options or display templates may be stored in the memory or storage device for display control unit 14, and used, respectively, for different fold states or configurations. For example but not by way of limitation, folding of the display device 12 along the center of the display unit 11 would invoke a format providing two display sub-areas in which information is displayed, while folding the display along two fold axes may invoke a format providing for display of visual information in three display sub-areas, each within a separate plane or substantially planar area of the display. In still another example embodiment, the display templates are based on the type of visual information to be displayed, such as text, pictures, images or video, such that method 170 (or any computer program implementing the method) changes the display format based on the type of information as well as in response to the folding state or configuration of the display. For example, video such as a movie might not be split between two different

sides of the display, but for example be shifted to display only in the display area on one side of a fold.

[0028] In still another example mode of operation, the display format or template provides a privacy mode of display in which only one, or certain ones, of the sub-areas of the folded display are used to display visual information, such that a viewer of the display device 12 can shield visual information displayed on the display device 12 from the view of others located near the display device 12. According to one such embodiment, the privacy mode of display is initiated by a user input to system 10. According to still other example embodiments, any unused portion of the display, for example a deformed portion in or near a fold, or a larger area not used for display due to the folding of the display unit 11, may be automatically, semi-automatically or manually (by user input), under control of method 170 (or any computer program implementing the method), deactivated and power to that area of the display reduced or eliminated, for example by directly reducing power or by altering the display data to substitute display data that causes the deactivated display area to be dimmed or darkened.

[0029] Referring now to FIGS. 6A, 6B and 6C, several example embodiments of devices incorporating display system 10 are illustrated. As illustrated in FIG. 6A, display system 10 may be incorporated in a reading device 200, such as an e-reader, that may be held in a user's hands and have a form factor such as that illustrated. As illustrated in FIG. 6B, display system 10 may be incorporated in a handheld mobile device such as a mobile telephone and/or smart phone 210. As illustrated in FIG. 6C, system 10 may be used in a personal computing system 220 with a foldable display 222 allowing the user to fold the display, for example to increase privacy in viewing the display in a crowded setting. Other devices that may incorporate the display system 10 include laptop computers, notebook computers, tablet computers, and display systems.

[0030] Referring now to FIG. 7, there is illustrated in schematic form an example computing system 700 suitable for use in display control unit 14 and/or fold detection system 54. System 700, according to one example embodiment, includes a central processing unit 710 including a processing unit 702 and memory 704, removable memory storage 712, and non-removable storage 714. Memory 704, which stores computer instructions or a computer program 725, may include volatile memory 706 and non-volatile memory 708. System 700 may include or have access to a computer environment that includes a variety of computer-readable (or machine-readable) media, such as volatile memory 706 and non-volatile memory 708, removable memory storage 712 and non-removable storage 714. Computer storage includes random access memory (RAM), read-only memory (ROM), erasable programmable read-only memory (EPROM) and electrically erasable programmable read-only memory (EEPROM), flash memory or other memory technologies, compact disc read-only memory (CD-ROM), digital versatile discs (DVD) or other optical disc storage, magnetic cassettes, magnetic tape, magnetic disc storage or other magnetic storage devices, or any other tangible and physical medium capable of storing computer-readable instructions. System 700 may include or have access to a computing environment that includes input 716, output 718, and a communications connection 720. The system 700 may operate in a networked environment using communications connection 720 to connect to one or more remote computers. The remote computers may include a per-